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Effects of Tobacco Smoking and Community Air Pollution on Myocardial  
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Studies are being conducted into the distribution of carboxyhemoglobin (COHB) in the general population and the effects of carbon monoxide (CO) on the cardiovascular system. A sensitive alveolar sampling technique utilizing gas chromatography has been developed and used to determine the COHB distribution in a sample of 3000 subjects. These data are correlated with the responses of the subjects on a questionnaire describing smoking history and other contacts with CO. Significant numbers of smokers were found with COHB saturations above 3.5%. Tunnel workers have been tested and found to have excessive levels of COHB. These workers are exposed to CO concentrations of up to 300 ppm. The synergistic effects between CO and nicotine are being studied in canine preparations. Preliminary evaluation indicates that the effects of 5% CO and nicotine on the myocardium are similar to previously reported work while administration of 0.1% had a significantly less dramatic effect. Studies with human subjects showed a decrease in arterial oxygen tensions following carbon monoxide breathing and increased minute ventilation, oxygen consumption, and cardiac output. Many nonsmokers with coronary disease have COHB saturations approaching that of smokers. Preliminary analysis has not revealed significant differences in either coronary anatomy or myocardial metabolism of smokers compared to nonsmokers, but we have not been impressed with the experimental data presented and are continuing a serial evaluation of all patients referred to coronary arteriography who are found to have coronary artery disease.

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